Adjustment Device for Furniture Fittings

The invention concerns an adjustment device for furniture fittings with a fixing screw that protrudes through an elongated hole extending in adjustment direction of a fitting plate with the fixing screw extending through a bore of a rotating disc that is arranged in a pivotable manner on the outer side of said fitting plate.

Technical furniture fittings such as assembly fittings, pullout tracks etc. must be fixed at a certain height on the respective furniture piece to keep the respective corresponding furniture pieces in their position relative to each other. Simply screwing on the furniture fittings, for example, does not provide sufficient accuracy of height. If a piece is to be screwed on with a certain degree of required accuracy, a corresponding high degree of accuracy is required for placing the respective bores as well as for manufacturing the furniture fittings. However, this would be quite labor intensive. This is why in many cases it is possible to subsequently adjust the height of the mounted furniture fitting. This ensures that there are no high tolerance requirements for the manufacture of the furniture fittings or for mounting said fittings to the furniture pieces because the desired exact adjustment, for example height adjustment, can be carried out subsequently by means of the adjustment device.

In known adjustment devices for furniture fittings a bore on the furniture fitting that accommodates a fixing screw is an elongated hole that extends in adjustment direction, for example in vertical direction. The furniture fitting can be adjusted vertically prior to tightening the fixing screw all the way. It also is possible to make subsequent adjustments, e.g. height adjustments, by loosening the fixing screw and moving the furniture fitting in vertical direction.

The disadvantage of such a simple design adjustment device is the fact that the furniture fitting can shift with high loads or when the fixing screw is tightened so that the desired alignment is lost. Since the fixing of the furniture fittings is actuated by adherence, the user tends to tighten the fixing screw as much as possible. This, however, can cause the fixing screw to strip so that it subsequently is no longer possible to fix the furniture fitting properly at this particular location.

In an adjustment device for furniture fittings as described in the introduction (DE 28 21 101 B2), the rotating disc that is mounted to the fitting plate is an adjusting lever that is arranged on a fixing screw on the furniture piece. The adjustment is achieved by way of two setscrews that act on the adjusting lever. Adjusting these setscrews, which

must be done in opposing direction, is relatively difficult. If the setscrews are not properly tightened or if the threads are worn, the adjustment position changes under load because there is no automatic lock for the adjusting lever.

In another adjustment device for furniture fittings (DE 27 52 779 C2) a rotating disc is used that is arranged in a pivotable manner on the outer side of a fitting plate with said rotating disc having a spiral-shaped building groove that is arranged on the inner side of said rotating disc that faces the fitting plate and wherein a guiding body is engaged. This adjustment device, however, only allows for adjusting a track relative to a U-profile track that accommodates said track and on which the rotating disc supports itself on its circumference. Therefore the possible uses of this adjustment device are very limited.

The object of the invention therefore is to design an adjustment device for furniture fittings as described in the preamble such that it provides easy adjustment and an effective setting of the furniture fitting that does not change under high load.

The object of the invention is attained in that the bore for the fixing screw is arranged in a central location on the rotating disc, in that the rotating disc is arranged on the fitting plate in a manner that allows height adjustment and in that the rotating disc, on its inner side facing the fitting plate, has a

spiral-shaped guiding groove wherein a guiding body that is connected to the fitting plate is engaged.

The adjustment, for example height adjustment, is accomplished by turning the rotating disc. In doing so the guiding groove glides along the guiding body arranged on the fitting plate which causes the rotating disc to move up or down or horizontally in relation to the fitting plate to the extent the elongated hole through which the fixing screw or a different fixing element, for example a rivet, extends, allows such movement. The fixing screw simultaneously serves as the pivot bearing for the rotating disc.

Since the spiral's incline is so small that an automatic lock is provided in vertical direction relative to the guiding body, the respective selected setting does not change with high loads, even if the rotating disc were arranged on the fixing screw in an easily pivotable manner. In addition, tightening the fixing screw more can also influence the smooth running of this bearing. Therefore no special measure is required for fixing the respective selected position. Thus any required subsequent adjustments are easily possible.

According to a preferred embodiment of the invention the rotating disc has a tooling shoulder on its outer side that faces away from the fixing plate with this tooling shoulder being a

profile recess that is arranged eccentrically in relation to the rotating axis of the rotating disc and that accommodates a screw driver, wherein the recess preferably is a cross recess for a crosstip screwdriver. Although the screwdriver engages eccentrically on the rotating disc, it is possible to easily rotate the rotating disc with a tool that is readily available.

It is practical for the guiding body to be ball arranged on an indentation on the fitting plate with half of it extending into the guiding groove whose cross-section has a semi-spherical shape. This provides a simple connection between the fitting plate and the rotating disc that is connected to the fixing screw with the connection being comprised of simple components.

Additional advantageous embodiments of the invention are the subject of additional sub-claims.

The adjusting device advantageously can be used as a height adjustment device at the end of a drawer or as a height adjustment device of an angle bracket of a furniture front plate.

The adjustment device in accordance with the invention advantageously can be used as a length adjustment device on one of two legs of a fitting angle,

in which case the adjustment direction extends at a right angle relative to the other leg of the fitting angle.

The invention is described in more detail based on exemplary embodiments below that are shown in the drawing.

Fig. 1 shows a height adjustment device for a drawer that is shown in its lowest position in Fig. 1,

Fig. 2 shows the height adjustment device according to Fig. 1 in a mean height position,

Fig. 3 shows the height adjustment device according to Fig. 1 in the upper position of the drawer,

Fig. 4 shows a profile along line IV-IV in Fig. 3,

Fig. 5 shows a profile along line V-V in Fig. 2,

Fig. 6 shows a front view of the rotating disc in direction of arrow VI in Fig. 4,

Fig. 7 shows the horizontal profile of a height adjustment device on an angle bracket for a furniture front plate,

Fig. 8 shows a somewhat modified embodiment,

Fig. 9 shows the vertical profile of a length adjustment device on one of the two legs of an angle bracket for furniture,

Fig. 10 shows a profile along line X-X in Fig. 9 and

Fig. 11 shows a profile along line XI-X in Fig. 9.

The adjustment device, which is a height adjustment device in Fig. 1 – 7 of the embodiment, is attached to a furniture fitting, in particular a telescope drawer pull 1 whose pullout front end provides the fitting plate 2 on which the height adjustment device is arranged. The height adjustment device has a rotating disc 4 that is arranged on the outer side 3 of the fitting plate 2. A fixing screw 5 extends through a central bore 6 of the rotating disc 4 and is screwed into the respective furniture piece 7, for example into the side wall of a drawer.

The rotating disc 4 has a collar 8 that surrounds the central bore 6 and protrudes from the front. Said collar fits into a vertical elongated hole 9 of the fitting plate 2 so that the rotating disc 4 can be arranged relative to the fitting plate 3 [sic].

On its outer side 10 that faces away from the fitting plate 2 the rotating disc 4 has a concentrically arranged crosstip recess 11 for a crosstip screwdriver as a tooling shoulder.

On its circumference the rotating disc 4 has a protruding circumferential collar 12 that is overlapped by two lateral guide brackets 13, 14 that are connected to the fitting plate 2. The guide brackets 13, 14 are sheet steel tongues that are punched out from the fitting plate 2 and are bent at a right angle. Below these guide brackets 13 and 14 the circumferential collar 12 of the rotating disc 4 not only can be turned but can also be shifted vertically.

On the inner side 15 that faces the fitting plate 2 the rotating disc 4 has a spiral-shaped guiding groove 16 into which a ball 17 engages as a guiding body when mounted, with the ball being arranged in an indentation 18, for example a bore of the fitting plate 2. Approximately half of the ball 17 extends into the guiding groove 16. The cross-section of the guiding groove 16, corresponding to the ball 17, has a semi-spherical shape.

Fig. 1 – 3 and especially Fig. 6 show that the guiding groove 16 extends over a circumferential angle of more than 360°, i. e. both ends of the guiding groove 16 overlap. It also is possible to have a guiding groove 16 with a smaller circumferential angle so that the ends do not overlap. It also is possible to have a guiding groove 16 with more overlap at the ends.

To adjust the height of the fitting plate 2 that forms part of the telescope pullout 1 relative to the side wall 7, the rotating disc 4 is turned by way of the crosstip recess 11. In doing so

the fixing screw 5 is only tightened far enough until only one rotation of the rotating disc 4 is possible. Since the ball 17 is fixed on the fitting plate 2 and the rotating disc 4 also is fixed on the furniture piece 7 in vertical direction via the fixing screw 5, the incline of the spiral-shaped guiding groove 16 causes the fitting plate 2 to be displaced in vertical direction when the rotating disc 4 is turned with the elongated hole 9 moving along the collar 8.

Fig. 1 shows the fitting plate 4 [sic] in the lowest position. If the rotating disc 4 is turned counterclockwise by 180°, for example, until it reaches the intermediate position shown in Fig. 2, the fitting plate 2 is lifted in the process. If the rotating disc 4 then is turned by another 180° in counterclockwise direction until it reaches the end position shown in Fig. 3, in which the ball 17 is located on the inner end of the guiding groove 16, the fitting plate 2 reaches its highest position with the collar 8 being at the lower end of the elongated hole 9.

Since the incline of the guiding groove 16 is considerably smaller than the automatic lock angle, the fitting plate 2 is automatically locked in every selected height adjustment position without requiring any special fixing mechanism. The fixing screw 5 can be tightened once the desired height is reached; however, this is not really necessary in order to fix the respective height adjustment in its position.

In the exemplary embodiment shown in Fig. 7 the described height adjustment device, for which the same reference numbers are used, is attached to an angle bracket 19 with which a furniture front plate 20 is attached to a drawer 7, for example. The previously described function of the height adjustment device in this case is used to align the front plate 20 vertically. The fitting plate 2 that carries the height adjustment device forms a leg of the angle bracket 19 whose other leg 21 is screwed to the back of the front plate 20 in a customary manner. The side wall of the drawer 7 in [sic] which the fixing screw 5 is screwed, just like in the embodiment according to Fig. 1 – 6, is a solid plate into which the fixing screw 5 is screwed, for example a particle board.

Deviating from this the sidewalls of the drawer 7'in the exemplary embodiment according to Fig. 8 are made of sheet steel. The fixing screw 5 is screwed into a threaded bush 5' with a top that extends through a bore of the sidewall of the drawer 7'.

Instead of a screwed connection it also is possible to use a rivet as a fixing element with which the adjustment device is attached to the sheet metal sidewall of the drawer 7.

In the exemplary embodiment in Fig. 9 – 11 the adjustment device is a

longitudinal adjustment device. The fitting plate 2 that carries the longitudinal adjustment device forms one of the two legs of an angle bracket 22. The adjustment device runs at a right angle relative to the other leg 23 of the angle bracket 22. The elongated hole 9 along which the collar 8 of the rotating disc 4 can be moved according to the exemplary embodiment of a longitudinal adjustment device in Fig. 9-11 extends at a right angle relative to leg 23 and thus determines the adjustment direction, for example in horizontal direction. The ball 17 that presents the guiding body in the spiral-shaped guiding groove 16, just like in the height adjustment device described above, is arranged in the extension of the elongated hole 9, i. e. between the longitudinal hole 9 and the leg 23.

Here, too, the two guide brackets 13, 14 that overlap the circumferential collar 12 of the rotating disc 4 are arranged on both sides of the elongated hole 9, i.e. in the example of a horizontal adjustment device above and below the rotating disc 4, so that the rotating disc 4 can move relative to the fitting plate 2 in adjustment direction.

The longitudinal adjustment device shown in Fig. 9 – 11 is used, for example, for pulling the furniture front plate 20 to which the leg 23 is screwed, against the furniture piece 7 to which the front plate 20 is attached by means of the fixing screw 5 of the rotating disc 4.